Mysore Local Examinations.

Notification D. No. 4—39-40—E1. 6451-81 of 38-39, dated the 18th July 1939.

Reference.—

(1) G. O. No. E. 4056—Edn. 249-36-4 dated the 25th May 1937, approving the revision of the courses of study proposed for the S. S. L. C. Examination with effect from the S. S. L. C. Examination of 1940.

(2) Memo No. E1. 2429-59—35-36, dated the 27—29th July 1937, forwarding printed copy of the detailed syllabuses under the revised S. S. L. C. Scheme to the Heads of all High Schools.

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It is notified for general information that the syllabuses and the Scheme of Examination in Mathematics for the S. S. L. C. Course are modified and published. The modification shall take effect immediately. The S. S. L. C. Examination for 1940 will be conducted according to the modified syllabuses in Mathematics.

4. ELEMENTARY MATHEMATICS.

4 (a) Arithmetic.

IV FORM—*Two periods a week.*

1. Arithmetical tables including the metric system.
2. Decimals excluding recurring decimals. Approximations.
3. Averages.
4. Percentages.
5. Profit and Loss.
6. Ratio and Proportion.
7. Proportional Parts and Partnership.

V FORM—*One period a week.*

1. Square measure. Areas of rectangles and circles, relation between the circumference of a circle and its diameter.
2. Square Root.
3. Cubic measure. Volume of rectangular solids.
4. Alligation and Mixtures.
5. Interest—Simple and Compound.

VI FORM—*One period a week.*

1. Time, Work and Speed excluding circular motion.
2. Present Worth, Discount and Bills of Exchange.
3. Stocks and Shares.
4. Statistical Graphs.

4 (b) Algebra.

IV FORM—*Two periods a week.*

1. Symbolic expressions.
2. Negative quantities and use of brackets.
3. The four fundamental operations of simple algebraic terms.
4. Elementary Laws of integral indices.
5. Simple equations and easy problems leading thereto—

Note.—Literal and fractional coefficients and reciprocals excluded.

V FORM—*One period a week.*

1. Factorisation.—

(*a*) By inspection and grouping.
(*b*) Of expressions of the form a^2-b^2 and ax^2+bx+c.—

Note.—Literal and fractional coefficients and reciprocals excluded.

2. The straight line graph.
3. Easy simultaneous equations with two unknown quantities and their solution graphically.—

Note.—Literal and fractional coefficients and reciprocals excluded.

VI FORM—*One period a week.*

1. Easy problems on simple and simultaneous equations.—

Note.—Literal and fractional coefficients and reciprocals excluded.

2. Multiplication and division of polynomials—Easy Exercises.
3. General revision.

4 (c) Geometry.

IV FORM—*Two periods a week.*

Lines and Angles.

THEOREMS.

1. The adjacent angles which one straight line makes with another straight line on one side of it are together equal to two right angles.
2. If at a point in a straight line, two other straight lines on opposite sides of it, make the adjacent angles together equal to two right angles, then these two straight lines are in one and the same straight line.
3. If two straight lines cut one another, the vertically opposite angles are equal.

Triangles.

4. If two triangles have two sides of the one equal to two sides of the other, each to each, and the angles included by those sides equal, then the triangles are equal in all respects.
5. The angles opposite to the equal sides of an isosceles triangle are equal.
6. If two angles of a triangle are equal to one another, then the sides which are opposite to the equal angles are equal to one another.
7. If two triangles have three sides of the one equal to the three sides of the other, each to each, they are equal in all respects.
8. If one side of a triangle is produced, then the exterior angle is greater than either of the interior opposite angles
9. If one side of a triangle is greater than another, then the angle opposite to the greater side is greater than the angle opposite to the less.
10. If one angle of a triangle is greater than another, then the side opposite to the greater angle is greater than the side opposite to the less.
11. Any two sides of a triangle are together greater than the third side.
12. Of all straight lines drawn from a given point to a given straight line the perpendicular is the least.

Parallels.

13. If a straight line cuts two other straight lines so as to make (i) the alternate angles equal or (ii) an exterior angle equal to the interior opposite angle on the same side of the cutting line or (iii) the interior angles on the same side equal to two right angles, then in each case the two straight lines are parallel.

14. If a straight line cuts two parallel lines it makes :—

(i) the alternate angles equal to one another ;

(ii) the exterior angle equal to the interior opposite angles on the same side of the cutting line ;

(iii) the two interior angles on the same side together equal to two right angles.

15. Straight lines which are parallel to the same straight line are parallel to one another.

(*Note.*—Formal proofs of Theorems 1, 2, 6, 9, 10, 12, 13, 14 and 15 are not required.)

Problems.—

1. To bisect a given angle.
2. To bisect a given straight line.
3. To draw a straight line perpendicular to a given straight line at a given point in it.
4. To draw a straight line perpendicular to a given straight line from a given external point.
5. At a given point in a given straight line to make an angle equal to a given angle.
6. At a given point to draw a straight line parallel to a given straight line.
7. To divide a given straight line into any number of equal parts.

V FORM—*One period a week.*

Triangles.

16. The three angles of a triangle are together equal to two right angles.

(*a*) The interior angles of any rectilineal figure together with four right angles are together equal to twice as many right angles as the figure has sides.

(*b*) If the sides of any convex rectilineal figure are produced in order, all the exterior angles so formed are together equal to four right angles.

17. If two triangles have two angles of the one equal to two angles of the other, each to each, and a side of the first equal to the corresponding side of the other, the triangles are equal in all respects.

18. Two right-angled triangles, which have their hypotenuses equal and one side of the one equal to one side of the other, are equal in all respects.

19. If two triangles have two sides of the one equal to two sides of the other, each to each, but the angle included by the two sides of one greater than the angle included by the corresponding sides of the other, then the base of that which has the greater angle is greater than the base of the other.

Conversely, if two triangles have two sides of the one equal to two sides of the other, each to each, but the base of one greater than the base of the other, then the angle contained by the sides of that which has the greater base is greater than the angle contained by the corresponding sides of the other.

Note.—Formal proof of theorem 19 is not required.

Parallelograms.

20. The straight lines which join the extremities of two equal and parallel straight lines towards the same parts are themselves equal and parallel.

21. The opposite sides and angles of a parallelogram are equal to one another, and each diagonal bisects the parallelogram.

22. If there are three or more parallel straight lines and the intercepts made by them on any transversal are equal, then the corresponding intercepts on any other transversal are also equal.

Problems.—

8. To construct a triangle given (a) the lengths of three sides, (b) two sides and the included angle, (c) two angles and one side.
9. To construct a right-angled triangle having given the hypotenuse and one side.
10. Problems on heights and distances.

VI FORM—*One period a week.*

THEOREMS.

Areas.

23. If the number of units in the length of a rectangle is multiplied by the number of units in its breadth, the product gives the number of square units in the area of the rectangle.

24. Parallelograms on the same base and between the same parallels are equal in area.

25. The area of a triangle is half the area of the rectangle on the same base and having the same altitude.

26. Triangles on the same base and between the same parallels (hence of the same altitude) are equal in area.

27. If two triangles are equal in area and stand on the same base and on the same side of it, they are between the same parallels.

28. The area of (i) a trapezium and (ii) a quadrilateral. Field Book.

29. In a right-angled triangle the square described on the hypotenuse is equal to the sum of the squares described on the other two sides.

30. If the square described on one side of a triangle is equal to the sum of the squares described on the other two sides, then the angle contained by these two sides is a right angle.

Note :—Formal proofs of theorems 23, 27, 28 and 30 are not required.

Problems.—

11. To construct quadrilaterals from given data.
12. To construct a parallelogram having given (a) two adjacent sides and the included angle, (b) two adjacent sides and a diagonal.
13. Areas of (1) a triangle (2) a quadrilateral.

II. OPTIONAL MATHEMATICS.

B. MATHEMATICS AND SCIENCE GROUP.

(i) Mathematics.

(a) Algebra.

V FORM—*Two periods a week.*

1. Prime numbers and prime factors.

2. Factorisation.

(*a*) By application of the formulae for $(a \pm b)^2$, $(a^2 - b^2)$, $(a^3 \pm b^3)$, $(a \pm b)^3$, $a^3 + b^3 + c^3 - 3abc$, $(a+b+c)^3 - a^3 - b^3 - c^3$ and $a^4 + a^2b^2 + b^4$

(*b*) Of trinomials of the form $ax^2 + bx + c$.

3. Simultaneous equations of the first degree including literal coefficients and reciprocals and problems involving such equations.

4. H. C. F. & L. C. M.

5. Simple fractions.

VI FORM—*Two periods a week.*

1. Functional notation.

2. The Remainder Theorem.

3. (*a*) Application of the Remainder Theorem to Factorisation.

(*b*) Factorisation of homogeneous and symmetrical functions.

4. Simple identities.

5. Solution of quadratic equations of one variable of the type $ax^2 + bx + c = 0$. Problems involving quadratic equations.

(b) Geometry.

V FORM—*Two periods a week.*

Revision of work done in Elementary Mathematics in Geometry with riders thereon and formal proofs of theorems that have not been studied formally.

Loci.

1. The locus of a point equidistant from two given points is the perpendicular bisector of the straight line joining the two given points.

2. The locus of points equidistant from two given straight lines is the pair of straight lines which bisect the angles between the two given lines.

Riders and numerical exercises on the above.

Loci ; problems on construction of triangles.

Circles.

1. If a straight line drawn from the centre of a circle bisects a chord which does not pass through the centre, it cuts the chord at right angles. Conversely, if it cuts the chord at right angles it bisects it.

2. One circle, and only one can pass through any three points not in the same straight line.

3. If from a point within a circle more than two equal straight lines can be drawn to the circumference, that point is the centre of the circle

4. The angle at the centre of a circle is double the angle at the circumference standing on the same arc.

5. Angles in the same segment of a circle are equal.

6. The opposite angles of any quadrilateral inscribed in a circle are together equal to two right angles. Conversely, if a pair of opposite angles of a quadrilateral are supplementary, its vertices are concyclic.

7. The angle in a semicircle is a right angle.

VI FORM—*Two periods a week.*

THEOREMS.

Areas.

Revision of Theorems 23 to 30 as in the Elementary Mathematics syllabus with formal proofs of Theorems 27, 28 and 30.

Circles.

(1) Equal chords of a circle are equidistant from the centre. Conversely, chords which are equidistant from the centre are equal.

(2) Of any of two chords of a circle, that which is nearer to the centre is greater than the one more remote. Conversely, the greater of the two chords is nearer to the centre than the less.

(3) If from any internal point, not the centre, straight lines are drawn to the circumference of a circle, then the greatest is that which passes through the centre, and the least is the remaining part of that diameter. And of any other two such lines, the greater is that which subtends the greater angle at the centre.

(4) If from any external point, straight lines are drawn to the circumference of a circle, the greatest is that which passes through the centre and the least is that which when produced passes through the centre. And of any other two such lines, the greater is that which subtends the greater angle at the centre.

(5) In equal circles, arcs which subtend equal angles, either at the centres or at the circumferences, are equal.

(6) In equal circles, angles, either at the centres or at the circumferences, which stand on equal arcs are equal.

(7) In equal circles, arcs which are cut off by equal chords are equal, the major arc equal to the major arc and the minor to the minor.

(8) In equal circles chords which cut off equal arcs are equal.

Tangent to a Circle.

(1) The tangent at any point of a circle is perpendicular to the radius drawn to the point of contact.

(2) Two tangents can be drawn to a circle from an external point.

(3) If two circles touch one another, the centres and the point of contact are in one straight line.

(4) The angles made by a tangent to a circle with a chord drawn from the point of contact are respectively equal to the angles in the alternate segments of the circle.

Riders and numerical exercises on the above.

Problems—Areas.

1. To construct a square on a given side.
2. Problems based on the property of a right-angled triangle, *viz.*, the square on the hypotenuse is equal to the sum of the squares on the other two sides.
3. To find graphically the square roots of integral numbers.
4. Area of (1) a triangle, (2) a trapezium, (3) a parallelogram, (4) a quadrilateral—Field Book.

Circles—

5. Given an arc of a circle to find its centre.
6. To bisect a given arc.
7. Angle in a semi-circle is a right-angle. To draw a tangent to a circle from a given external point.
8. To draw common tangents to two circles.
9. To circumscribe a circle about a given triangle.
10. To inscribe a circle in a given triangle.
11. To draw an escribed circle of a given triangle.
12. To draw a regular polygon, (i) in and (ii) about a given circle.

SCHEME OF EXAMINATION.

B. Mathematical and Science Group.

Mathematics.—

			Marks.
Algebra ...	50 marks	3 hours	100
Geometry ...	50 „		